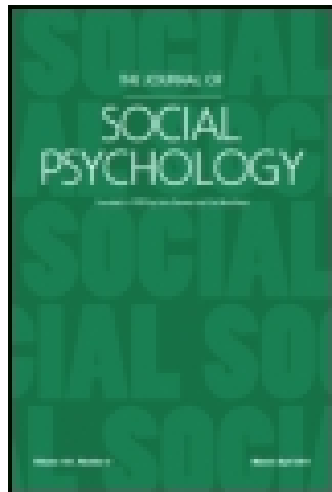


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Priming Effects on Cooperative Behavior in Social Dilemmas: Considering the Prime and the Person

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ABSTRACT. We test whether people with a relatively more intrinsic vs. extrinsic value orientation (RIEVO) are particularly likely to enact cooperative behavior in resource dilemmas when they are primed with relatedness goals. In Study 1, high RIEVO participants primed with relatedness exhibited more restrained fishing behavior in a resource dilemma than their unprimed counterparts or participants low in RIEVO. Study 2 replicated this effect and further showed that the prime must signal the possibility of satisfying a valued goal (relatedness satisfaction) in order to elicit the value-consistent behavior. We discuss these results in the context of recent process models of goal priming, and also discuss how these findings contribute to our understanding of cooperative behavior and the predictive power of value constructs more broadly.

Keywords: cooperation, extrinsic values, goal priming, intrinsic values, social dilemmas, values

THAT GOAL PRIMING CAN GENERATE goal pursuit is now a well-established phenomenon, resting on the shoulders of large and growing body of experimental findings and theoretical work over the past 2 decades (for reviews, see: Bargh & Chartrand, 1999; Hassin, 2013). Goal priming studies have repeatedly demonstrated that subtle exposure to goal-related stimuli can induce the pursuit of goals outside of people's awareness (see, e.g., Custers & Aarts, 2010 for a review). For example, participants primed with achievement via a scrambled sentences task (Srull & Wyer, 1979) work harder to solve anagrams, those primed with cooperation restrain taking in a resource dilemma (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001), and more recent studies demonstrate that people adopt the goals that they see others enact (Dik & Aarts, 2007). Although some particular effects remain controversial in the eyes of some, like the induction of slow walking by priming old age (Bargh, Chen, & Burroughs, 1996; Doyen, Klein, Pichon, & Cleeremans, 2012), other findings have been frequently replicated in various labs, such as activating achievement and cooperative goals (see, e.g., Hart & Albarracín, 2009; Kleiman & Hassin, 2011; Nash, McGregor, & Prentice, 2011). Further, goal priming effects have received enough consistent support that applied researchers have started to incorporate them into models of problem behaviors and intervention strategies (e.g., overeating; Papies, 2012), and new theories of the roles conscious and nonconscious motivation processes are proliferating in the wake of these findings (e.g., Baumeister & Masicampo, 2010; Hassin, 2013).

However, the demonstration of basic main effects of goal primes does not address an important question: For whom should goal primes be effective, and why? Researchers have thus suggested taking up “second-generation questions” (Bargh, 2006, p. 148) that explore personal and situational moderators and also advance our understanding of the process that translates goal primes into behavior. Toward this end, Custers and Aarts (2010) proposed a basic process model of goal pursuit following priming. In this model, goal primes first activate a representation of a goal outside of a person’s awareness. The activation of the representation automatically guides attention and prepares a behavioral action program for the pursuit of the goal. However, in order for the goal activation to ultimately translate into overt behavior, the goal must also be one that carries enough reward value for the person to exert effort to pursue it. The reward value of a goal can vary due to tradeoffs from other conflicting goals, ease of attainment, and individual differences in reward preferences. In simpler terms, the primed goal must be both viable and somehow appealing for behavior to occur.

Incentive Value Links Primes to Behavior

Supporting the notion that incentive value strengthens the prime—behavior link, past research has shown that drinking primes are effective primarily if people are situationally disposed to want to drink (i.e., thirsty; Strahan, Spencer, & Zanna, 2002), and that tired people are more likely to assimilate to a dextrose brand pill advertisement than people who are not tired (Bermeitinger, Goelz, Johr, Neumann, Ecker, & Doerr, 2009). Further, manipulations of reward value have shown that providing reward signals in combination with subliminal effort primes increased participants’ effort on a handgrip squeeze task (Aarts, Custers, & Marien, 2008), and increasing the incentive value of correct responses via rewards improves performance after an achievement prime (Milyavsky, Hassin, & Schul, 2012).

These studies suggest that state-deficit or situational incentives can strengthen the prime—behavior link, but little research has examined whether chronic motivational orientations can do the same. This should be the case, as these motivational orientations inform the experiential inputs people prefer and want to have (cf. McLelland, 1985; see also Job, Bernecker, & Dweck, 2012), or the potential worthiness of pursuit people attach to types of goals. Broadly speaking, motivational orientations indicate how people seek to derive satisfaction from their environment. People with a strong affiliation motive, for example, direct behavior across time and contexts toward cues which promise the attainment of affiliative incentives because these incentives were previously associated with rewarding, positive experiences (McClelland, 1985). Motivational orientations, then, are likely to favor behavioral enactment in response to goal primes because they indicate the incentive value people place on the attainment of certain types of goals, and thus the extent to which people are likely to pursue a goal that is prepared by situational cues.

In support of this notion, past research has shown that motives can impact the effect of nonconscious primes. In one study, participants primed by stereotypically helpful social groups assisted researchers more to the extent that they had previously self-reported finding helping others important (Aarts, et al., 2005). Other research has shown that achievement primes are most likely to induce achievement striving in people that are chronically high in explicit achievement motivation (Hart & Albarracín, 2009). Although the research of Hart and Albarracín (2009) demonstrates that a generalized achievement orientation can predict domain-relevant behavior, Aarts and colleagues’ (2005) demonstration does not test this generalized motive question

because it examines the moderating effect of the particular goal for the particular behavioral outcome they assessed. Thus, it remains an open question if broad motivational orientations moderate a goal prime's effect on prosocial behavior. Here, we examine this question in the context of social dilemmas.

Relatedness, Priming, and Cooperation

Self-determination theory posits that humans have three fundamental psychological needs for autonomy (feeling that one's behaviors are chosen by one's self), competence (feeling that one can cause desired effects), and relatedness (feeling that one is connected to others) and that people thrive when they are satisfied (Ryan & Deci, 2000). Recent research and theorizing has suggested that these needs also behave like motives (Sheldon, 2011) in that wanting a need predicts its attainment (Sheldon & Schöler, 2011), and activating needs can induce need-relevant striving (Sheldon & Gunz, 2009; see Prentice, Halusic, & Sheldon, 2014 for a review). Relatedness has been linked to cooperative intentions and behavior in previous research, likely due to the fact that cooperative behavior allows for experiences of connectedness (Weinstein & Ryan, 2010). For example, correlational research suggests that relatedness satisfaction is positively associated with prosocial tendencies (Gagné, 2003). In a series of experimental tests, results from Pavey, Geitemeyer, and Sparks (2011) suggest that satisfying relatedness leads to prosocial intentions and behaviors.¹ What remains unclear from this research conducted from the self-determination theory perspective, however, is whether merely activating a relatedness goal (rather than satisfying it) can induce cooperative behavior.

Past research from the goal priming literature points to this possibility, as goal primes have been shown to enhance cooperative behavior in situations in which there is conflict between group- and self-interests. For example, Bargh, Gollwitzer, Lee-Chai, Barndollar, and Trötschel (2001, Study 2) demonstrated that participants primed with cooperation-related words in a scrambled sentences task tended to return more fish to a common lake after each fishing season in a simulated resource dilemma. Participants primed with cooperation were also more likely to make cooperative decisions in the Prisoner's Dilemma, as well as expect more cooperative behavior from others (Kay & Ross, 2003). In contrast, priming competence reduces cooperation, especially among competitive individuals (Utz, Ouwerkerk, & Van Lange, 2004).² Though these results are encouraging in that they suggest a means to modify cooperative behavior in dilemmas through priming and point to some individual difference moderators, to date it is still an open question whether a prime that can induce cooperation interacts with the dispositional orientation toward affiliative goals. Establishing such moderators would not only advance progress on goal priming's second generation questions and lend further support to the incentive value proposition of the process model above (Custers & Aarts, 2010), it could also have important implications for our understanding of the conditions under which priming cooperative behavior in particular is effective. Knowing this may allow for more targeted and effective interventions for enhancing cooperation in resource dilemmas, e.g., by organizations trying to enhance sustainable group behaviors.

For the case of cooperative behavior in resource dilemmas, value orientations provide a promising indicator of an individual's likelihood of translating a goal prime into behavior. Generally speaking, value orientations are "conceptions of the desirable that influence the ways people select action and evaluate events" (Schwartz & Bilsky, 1987, p. 550). As such, they provide

individuals broad, guiding principles for behavior and are informative of the classes of goals that hold incentive value for people. Further, values can provide an indication of how people balance the pursuit of individual- and group-level needs (Schwartz, 1996), a balancing act that is of central importance in resource dilemmas.

Cooperative Behavior and Relative Intrinsic Versus Extrinsic Value Orientation

Cooperation is typically rewarding upon enactment (Krill & Platek, 2012; Rilling, et al. 2002), but not everyone will recognize the potential hedonic reward value to the same extent, so wanting to cooperate can vary. One promising index of the disposition to find cooperative behavior motivating is the construct of relative intrinsic to extrinsic value orientation, or RIEVO. Intrinsic valuing is characterized by ascribing importance to contributing to the community, self-acceptance, and affiliation, whereas extrinsic valuing is characterized by ascribing importance to personal financial success, social status, and physical attractiveness (Kasser & Ryan, 1996). People high in RIEVO generally exhibit less acquisitive strategies in commons dilemmas and maintain group resources longer (Sheldon & McGregor, H., 2000), naturally assort with similarly cooperative people (Sheldon, Sheldon, & Osbaldiston, 2000), and engage in more ecologically responsible behavior in their daily lives (Brown & Kasser, 2005). By contrast, as extrinsic values begin to overshadow intrinsic ones people become more anti-egalitarian and ethnically prejudiced (Duriez, Vansteenkiste, Soenens, & De Witte, 2007), experience more conflicted romantic relationships and friendships (Kasser & Ryan, 2001) and are generally less psychologically well-adjusted and healthy than relatively intrinsic persons (Kasser & Ryan, 1993; 1996; see also Kasser, 2002 for a review). Because people high in RIEVO see reward in affiliative and cooperative experiences with others, we suggest that they are likely to translate the activation of a relatedness goal into concrete cooperative action.

The Present Studies

Past research has demonstrated that the pursuit of cooperative goals can be activated subtly. However, Custers and Aarts' (2010) model of goal priming suggests that some primes must arouse a desirable goal to pursue in order for primes to translate to behavior. Other research has demonstrated that RIEVO indexes both how important people find cooperative behavior to be and how likely they are to enact it given the opportunity (e.g., Sheldon & McGregor, H., 2000). The present studies bridge these findings and propose that goal primes that produce cooperative behavior will be most effective for people who find incentive value in cooperation, i.e., those high in RIEVO. In what follows, we test this proposition in two studies. In Study 1, we measure participants' RIEVO and prime them with either a relatedness goal or no goal and examine their subsequent behavior in a resource dilemma (a multi-season fishing simulation, as in Bargh et al., 2001). We expect this goal prime to be effective in producing cooperative behavior to the extent that participants prioritize the intrinsic goals of community contribution, self-acceptance, and affiliation over personal financial success, attractiveness, and popularity.

In Study 2, we again test whether RIEVO predicts greater cooperative behavior after a relatedness prime. We also further address the notion that effective goal primes signal incentives.

To do this, we use three goal prime conditions: one in which the prime suggests relatedness satisfaction, one in which the prime suggests relatedness dissatisfaction, or one in which no goal is primed. We expect to see greater cooperation only if the prime suggests a desirable end (relatedness satisfaction) and the person represents the incentive value of that end (high RIEVO).

STUDY 1

Participants and Procedure

Participants were 47 students enrolled in a social psychology course. Five participants did not complete the measure of RIEVO during the mass pretesting session and were excluded from analyses, leaving a sample of 42 for analysis (31 female, 33 Caucasian, mean age = 20.8, $SD = 1.05$).

Participants completed pre-test measures for extra course credit at the beginning of the semester, which included demographics and our measure of RIEVO. Later, they signed up for the lab study for extra course credit. Participants arrived at the lab in groups of up to four for the experimental portion of the study. Upon arrival, the experimenter informed the participants that they would be completing two separate studies. The first ostensible study comprised a packet containing filler questionnaires and activities. The experimenter provided participants the packet with instructions, and then left the room. The packets culminated in a scrambled sentences task that constituted our goal prime manipulation. On the last page of the packet, participants were instructed to close the packet and inform the experimenter when they had completed “study 1,” at which point the experimenter returned and seated them at a computer to complete “study 2.” The experimenter then launched the FISH 3.1 program (Gifford & Gifford, 2000), which walked the participants through instructions and game play and checked for participant comprehension of the game before allowing gameplay. Once the game ended, participants completed a packet containing manipulation and suspicion checks and a debriefing. Experimenters were blind to condition in that both study packet versions (i.e., those containing neutral vs. relatedness goal primes) were filed together in the same location and experimenters were instructed not to open packets, examine open packets, or observe the participants as they worked on the study materials.

Materials

RIEVO. In an online mass pre-testing session a month or more before the experimental session, participants completed a number of questionnaires, including our measure of values. To assess RIEVO, participants saw a number of goal statements and asked how important it was that they fulfill the goal in the future. They then responded to six items to assess intrinsic (“helping those who need help,” “having close personal relationships; feeling close to various people,” and “attaining self-understanding and personal growth”) and extrinsic (“projecting an appealing and attractive image,” “achieving affluence and financial success,” and “being known and admired by many people”) goals employed in past research (e.g., Sheldon, 2007; Sheldon & Kasser, 2008; Sheldon & Krieger, 2014; see also Kasser and Ryan 1993, 1996). Items were rated from 1 (*not*

at all important) to 5 (very important). The three extrinsic items were subtracted from the three intrinsic items to provide a measure of RIEVO ($\alpha = .73$; as in, e.g., Sheldon & Krieger, 2014).

Goal priming manipulation. Participants completed a scrambled sentences task in which they arranged 16 sets of five words to form grammatical, four-word sentences. Participants were randomly assigned to either a relatedness or neutral prime condition.³ In the relatedness prime condition, eight of the sentences contained words intended to activate relatedness goal striving (e.g., *caring, include*). All of the completed sentences in this prime signaled relatedness satisfaction, e.g., “Mary felt very supported.”

Fishing game. Participants were seated at a computer to play FISH 3.1 (Gifford & Gifford, 2000), a computer game designed to measure cooperative versus competitive decision making in commons dilemmas. Participants can choose to cooperate using a restrained fishing strategy that results in modest short term gain but long-term conservation (if others are also self-restrained), or defect using an acquisitive fishing strategy that results in large short term gain but depletes the resource more rapidly. Participants fished the resource with three other simulated fishermen (and were not led to believe the other fishermen were fellow participants in their session). Competitiveness parameters were varied for each simulated fisherman but were held constant within fisherman across all participants. Thus, each simulated fishermen behaved in a similar manner for each participant (but not necessarily identically as the computerized fishermen are responsive to other variables in the game, e.g., remaining stock; see Gifford & Gifford, 2000), and competitiveness between the simulated fishermen varied so that some were more competitive than others. Each game started with a shared pond of 250 fish, ± 40 “mystery fish” that provided some uncertainty about exactly how many fish the pond contained. Fish that were certainly present appeared in a solid pink color in the resource, whereas uncertain fish appeared only as outlines. Participants harvested fish by clicking a button to make individual casts for fish, or they could enter a numeric value in an open field to “cast for any number.” Participants incurred a small fee for each minute spent away from port and could click to return to port and end a fishing season. Fish left after each season would spawn and partially replenish the resource at a constant ratio of remaining fish. The game screen displayed time at sea, fish caught, expenses, income, and profit for oneself and each simulated fisherman for the current season as well as cumulative totals across all seasons. The game terminated automatically if the participant completed 10 seasons or if the resource reached zero fish, whichever occurred first, and participants were unaware of the 10 season stopping rule. The dependent measure was the total number of fish taken from the resource by the participant.

Manipulation check. Participants completed an 18-item measure of psychological need satisfaction (Sheldon & Hilpert, 2012) that assessed the extent to which they felt satisfied or dissatisfied in their autonomy, competence, and relatedness while playing the game, e.g., “I felt a strong sense of intimacy with the people I spent time with,” 1 (*no agreement*) to 5 (*much agreement*), α for relatedness satisfaction = .90. We reasoned that if the scrambled sentence task effectively activates relatedness goal striving, being primed with relatedness and then being able to pursue that goal via a cooperative game would result specifically in greater relatedness need satisfaction (see Prentice, Halusic, & Sheldon, 2014; Sheldon, 2011; Sheldon & Gunz, 2009; Sheldon & Schüler, 2011).

RESULTS

Manipulation Check

We first examined whether relatedness need satisfaction differed between the two experimental groups. As hypothesized, relatedness need satisfaction was higher in the relatedness prime group ($M = 1.91$, $SD = .93$) than the control ($M = 1.20$, $SD = .35$; $t(41) = 3.22$, $p = .003$). This suggests that prime aroused the motive and the game subsequently provided satisfying need-relevant feelings. Exploratory analyses revealed that effect of priming condition was specific to relatedness satisfaction and not dissatisfaction or either of the other needs, and that it was not moderated by RIEVO or cooperative behavior.

Preliminary Analysis

Because participants could vary in how many seasons they could play, we inspected our dependent variable for non-normality. Visual inspection and the Shapiro-Wilk normality test indicated that the distribution was non-normal, $W = .95$, $p = .032$. To remedy this, we employed a Box-Cox (1964) analysis (Friendly, 2002), which can identify the transformation at which mean square error is minimized, and this recommended a power transform of $\lambda = -.4$. After this transformation, we multiplied the transformed fish taken variable by -1 so that higher scores represented more fish taken from the resource.

Examination of the suspicion check data revealed that no participant was aware of study hypotheses or the intent behind the scrambled sentences task.

Hypothesis Testing

For the main analysis we regressed fish taken on effect-coded goal prime (-1 = neutral control, 1 = relatedness prime), mean-centered RIEVO, and the goal prime \times mean-centered RIEVO interaction term (zero-order correlations are presented in Table 1). Significant main effects were qualified by the predicted interaction, which improved a main effects model significantly, $\beta = -.36$, $t(41) = -2.08$, $p = .045$, $\Delta R^2 = .08$ (see Table 1). The simple effect and simple slope analyses (tested following West, Aiken, & Krull, 1996) relevant to the focal hypothesis revealed

TABLE 1
Study 1 Descriptives, Zero-Order Correlations, and Regression Model Statistics

Predictor	Descriptives and correlations				Regression statistics	
	Mean	SD	2	3	β	t
1. RIEVO	.64	.76	-.18	-.19	-.49	-3.54*
2. Goal prime	.55	1.01		.01	-.33	-2.42*
3. RIEVO \times Goal prime	.54	1.08			-.28	-2.08*

Note. $n = 42$, model $F(3,41) = 5.97$, $p = .002$, $R^2 = .32$. Means and standard deviations are before effect-coding and mean-centering. Correlations are based on terms as entered into the regression model, i.e., effect-coded condition and mean-centered RIEVO.

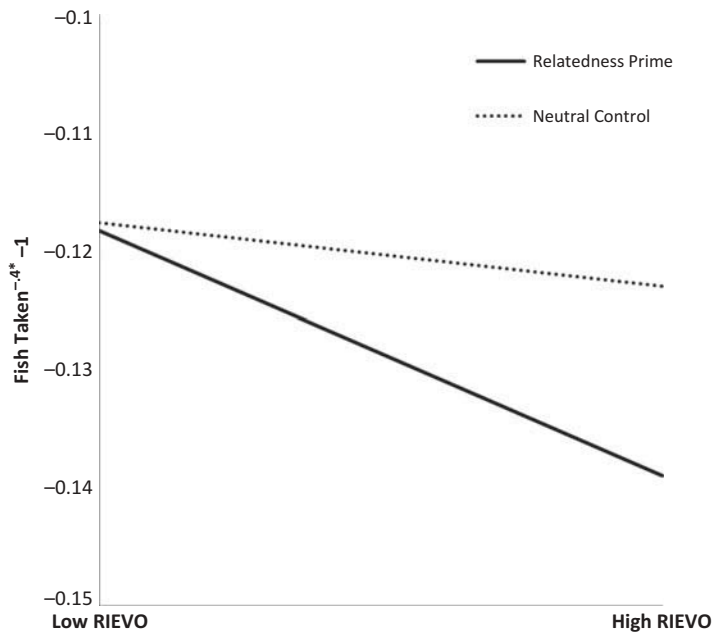


FIGURE 1 Total fish taken as a function of goal prime condition and RIEVO.

that: a) at high RIEVO, fish taken was significantly lower in the relatedness prime condition than in the neutral control condition, $\beta = -.47$, $t(41) = -3.05$, $p = .004$; and b) in the relatedness prime condition, fish taken inversely related to RIEVO, $\beta = -.78$, $t(41) = -3.64$, $p < .001$ (see Figure 1). These results indicate that the relatedness goal prime induced cooperative behavior by lowering fish acquisition particularly among high RIEVO participants, and that in the relatedness prime condition RIEVO predicted restrained fishing.

We noted that participants may have had more opportunities to acquire fish depending on how long the resource lasted, which was partly a function of each participants' actions. Thus, to control for this potential influence on the results, we verified that seasons fished was correlated with the outcome, and, upon finding that it was, added it as a covariate to the regression model presented above. Adding this covariate slightly reduced the interaction term to "marginal" ($p = .067$) and, most importantly, left the simple slope and simple effects test reported above essentially unchanged. Thus, adding this covariate does not meaningfully alter the conclusions of the focal analyses.

BRIEF DISCUSSION

The results of Study 1 supported the hypothesis that goal primes that induce cooperative behavior are particularly likely to do so for people who tend to orient more toward intrinsic relative to extrinsic values. Further, the model prediction of the fishing outcome, Cohen's $f^2 = .47$, was

quite large (Cohen, 1992), which allowed for our observed effects to emerge despite a fairly small sample. In Study 2, we add support for this observation by replicating this effect employing stricter methodological controls and using a larger sample. We also address further theoretical questions, which we review next.

STUDY 2

Study 1 demonstrated that inducing cooperative behavior with goal primes is effective to the extent that people find incentive value in cooperative versus competitive pursuits, as indicated by RIEVO. In Study 2 we replicate and extend this effect in a few ways. First, we measure RIEVO in a more comprehensive manner. Second, we defend against any potential experimenter effects, a source of potential confounding in priming research, by conducting the study over the Internet (Klein et al., 2014). Third, we increase our sample size as mentioned previously.

We also extend Study 1 in a theoretically important way by examining whether the goal prime must signal the potential satisfaction of a need rather than simply activate goal domain relevant cognitions. If the potential to gain goal-relevant incentives drives priming effects, then it follows that the prime must suggest an opportunity for satisfaction, rather than merely activate cognitions related to the goal domain generally. The relatedness prime in Study 1 contained sentences that all suggested satisfaction, but there was no comparison condition to address the possibility that mere need-relevant content is sufficient. Thus, in Study 2 we held domain content constant and manipulated whether the priming materials suggest satisfaction or dissatisfaction of relatedness. We predicted that it would only be the possibility to satisfy relatedness that drives priming effects for those who represent that incentive.

METHOD

Participants and Procedure

Participants were 130 students (53% female, mean age = 19.0, $SD = 1.69$) enrolled in an introductory psychology course. Although we observed a large effect in Study 1, we assumed a medium effect in designing Study 2 because of the potential for overfitting in small samples and sample appropriately. All study materials were completed in a single online session for partial course credit. Participants signed up through an online study administration site for a study of “personality and goals.” After following a link to the study, participants first gave consent and then completed all study materials. They then completed a set of questionnaires that contained our measure of RIEVO, as well as some questionnaires irrelevant to values or cooperation to obscure the purposes of the study. Next, participants were randomly assigned to our goal priming conditions and completed either a relatedness satisfaction, relatedness dissatisfaction, or neutral goal prime scrambled sentences task, which was introduced as a separate pilot study to test the materials for future research. Finally, they completed delay filler measures and our measure of cooperation (Triple Dominance Measure; Van Lange, Otten, DeBruin, & Joireman, 1997) and received a debriefing about the purposes of the study.

Materials

RIEVO. Participants completed the full Aspirations Index (Grouzet et al., 2005), a cross-culturally validated measure of values. The Aspirations Index contains 57 statements of goals “[one] may have for the future,” such as “I will have many expensive possessions,” and “The things I do will make peoples’ lives better,” that participants rated for importance from 1 *not at all* to 9 *extremely*. The Aspirations Index provides summary measures of the three intrinsic and three extrinsic domains used in Study 1 (as well as five others not relevant to intrinsic/extrinsic concerns). An EFA of the intrinsic and extrinsic domain summary scores revealed the typical two factor solution with two factors with eigenvalues over 1 (next closest .36) explaining 83.60% of the variance (extrinsic $\alpha = .87$, intrinsic $\alpha = .92$, combined RIEVO $\alpha = .90$). We mean-centered each value domain within participant by subtracting average valuing across the 11 value domains, then created ipsative summary intrinsic and extrinsic scores comprising their three respective domains, and finally subtracted the extrinsic summary score from the intrinsic one to derive RIEVO ($M = .84$, $SD = 1.01$) from the Aspirations Index.

Goal priming manipulation. Participants completed a scrambled sentences task similar to Study 1. Participants were randomly assigned to a relatedness satisfaction, relatedness dissatisfaction, or neutral control condition. The satisfaction sentences signaled attainment of relatedness, whereas the dissatisfaction sentences suggested the opposite, e.g., “The child felt (ex)included.”

Social value orientation. Participants completed our dependent measure of cooperative behavior, the Triple Dominance Measure (TDM; Van Lange et al., 1997). The TDM is a decomposed game that asks respondents to imagine being paired with another person they do not know and will not knowingly meet in the future. They are then presented with nine scenarios with three response options each for allocating points to oneself and to the other, e.g., You get 550, Other gets 300; vs. You get 500, Other gets 100; vs. You get 500, Other gets 500. Choices in the TDM can be scored as cooperative, individualistic, or competitive. A participant who makes consistent (i.e., six or more) cooperative choices can then be categorized as “prosocial,” whereas one who makes consistent individualistic choices can be categorized as “proself.” Respondents who meet neither threshold are not categorized. Because the TDM loses some information by categorizing the outcome and ignores participants who do not reach categorical thresholds, we also computed a continuous cooperation measure by subtracting the points allocated to the other from points allocated to self (as in Sheldon, 1999).

Although the TDM is most often used to measure a disposition, we used it as our dependent variable here for a few reasons. For one, its format clearly operationalizes cooperative behavior in that people can choose to enhance joint outcomes (or not; i.e., it is a mixed-motive scenario). Further, Van Lange, de Cremer, Van Dijk, & Van Vugt, (2007, p. 544) note that the choices people make in mixed-motive scenarios are shaped by “the self, the interaction partner, and/or the situation” and thus are not simply a reflection of “traited” decision rules. This is further supported by evidence that the TDM has fairly low test-retest reliability, which suggests that peoples’ decisions in the task are informed to a large degree by state-related processes (as reviewed in Van Lange et al., 2007).

RESULTS

Preliminary Analyses

As in Study 1, the distribution of the continuous cooperation variable was non-normal ($W = .86$, $p < .001$) and we made adjustments as recommended by the Box-Cox (1964) procedure. This resulted in taking the log of the continuous measure of cooperation ($\lambda = 0$).

Examination of the suspicion checks data revealed that participants were unaware of study hypotheses or the intent behind the scrambled sentences task. Some participants did note thematic elements to the prime materials, but this does not constitute awareness of the experimental intent of the prime and thus we retained these observations for analyses.

Hypothesis Testing

We first created two dummy coded condition vectors. The neutral condition served as the reference group in each. For dummy 1, satisfaction was set to one and dissatisfaction was set to zero. For dummy 2, dissatisfaction was set to one and satisfaction was set to zero. We mean-centered RIEVO, and then created product terms of mean-centered RIEVO and each of the dummy coded variables. Next, we regressed our continuous measure of cooperation onto the two dummy vectors, mean-centered RIEVO, and the two product terms. Examining changes in model prediction revealed that the addition of the satisfaction condition (dummy 1) \times RIEVO term in particular significantly improved upon a main effects model (see Table 2).

Simple effects analyses of the interaction revealed that for participants low in RIEVO ($-1 SD$), neither priming group exhibited different levels of cooperation from the control group, $|t|s \leq 1.00$. However, for participants high in RIEVO ($+ 1 SD$), those in the relatedness satisfaction group exhibited significantly more cooperation than did their counterparts in the neutral

TABLE 2
Study 2 Regression Model Statistics Predicting Continuous Measure of SVO Cooperation

Predictor	Model statistics					Change in prediction		
	<i>b</i> (<i>SE</i>)	<i>CI</i>	<i>t</i>	<i>p</i>	β	ΔR^2	<i>F</i>	<i>p</i>
Dummy 1	−0.24 (.13)	−0.49, −0.01	−1.89	0.061	−0.19	0.03	4.53	0.035
Dummy 2	−0.05 (.13)	−0.32, 0.21	−0.39	0.694	−0.04	0.00	0.30	0.585
RIEVO	0.01 (.08)	−0.15, 0.17	0.10	0.919	0.02	0.00	0.54	0.463
Dummy 1 \times RIEVO	−0.18 (.11)	−0.40, −0.05	−1.58	0.117	−0.20	0.03	4.65	0.033
Dummy 2 \times RIEVO	0.07 (.12)	−0.16, 0.31	0.60	0.551	0.07	0.00	0.36	0.551

Note. $n = 130$, model $F(5,124) = 2.09$, $p = .071$, $R^2 = .08$. ΔR^2 analyses were conducted as terms were entered sequentially in the model in the order in which they appear in the table. Dummy 1 = Satisfaction vs. Neutral, Dummy 2 = Dissatisfaction vs. Neutral.

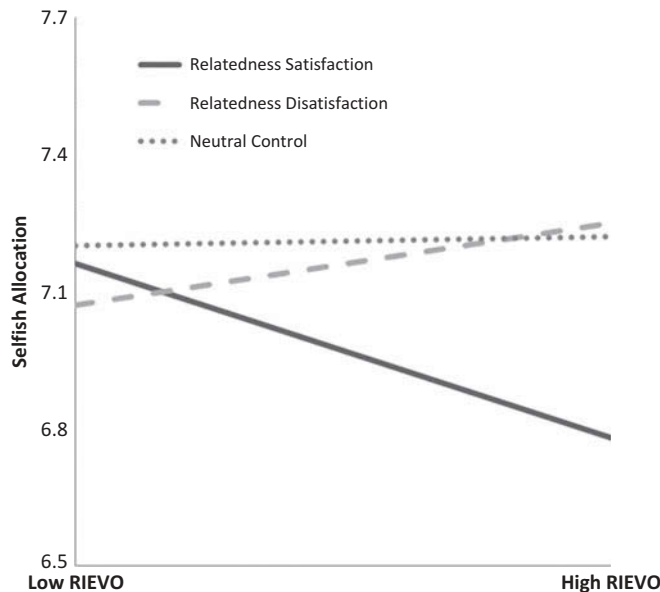


FIGURE 2 Cooperation as a function of goal prime condition and RIEVO. Increasing values on the y-axis show larger self-other point discrepancies and thus decreasingly cooperative allocations.

condition, $\beta = -.35$, $t(129) = -2.57$, $p = .01$. Further, the relatedness satisfaction group was also more cooperative than the relatedness dissatisfaction group at high RIEVO $\beta = -.37$, $t(129) = -2.44$, $p = .02$. Cooperation was not different between the neutral and relatedness dissatisfaction groups at high RIEVO, $\beta = .02$, $t(129) = -.14$, $p = .89$. Analyzed differently, the simple slopes of RIEVO in the relatedness dissatisfaction and neutral conditions did not predict cooperation, both $\beta_s \leq .15$, $t_s \leq 1.00$, $p_s > .35$, whereas this slope was significant in the relatedness satisfaction condition, $\beta = -.31$, $t(129) = -2.17$, $p = .03$ (see Figure 2).

As noted above, although there is precedent for using a continuous version of SVO (Sheldon, 1999), the measure is designed to generate a categorical outcome. Thus, we wanted to examine whether the categorical approach could corroborate the results of the analysis with the continuous measure. To do this, we first categorized participants as either prosocial or prosocial (following Van Lange et al., 1997), such that prosocial = 1 and prosocial = 2. This reduced the n for the models by 36 as some participants did not meet thresholds for categorization. We next constructed a binary logistic regression model using SAS PROC LOGISTIC with priming condition, RIEVO (mean-centered), and their interaction predicting SVO category (where 1 = prosocial and 2 = prosocial to reflect previous). The Hosmer–Lemeshow goodness-of-fit test yielded a $\chi^2(8)$ of 6.47 and was not significant ($p = .59$), suggesting a good model fit to the data, and the model correctly identified 67.7% of the cases. The interaction between RIEVO and the satisfaction condition emerged as significant both when the neutral priming group was set as the reference group and when the dissatisfaction group was set as the reference. Regression statistics are presented in Table 3. These results are consistent with those presented above, and emerged even despite the loss of statistical power due to non-categorized participants and the loss of information in the

TABLE 3
Logistic Regression Analysis Predicting SVO Category

<i>Predictor</i>	<i>b</i>	SE	<i>Wald's</i> χ^2	<i>p</i>
Dummy 1	−0.56	0.54	1.07	0.301
Dummy 2	0.13	0.57	0.05	0.816
RIEVO	0.19	0.35	0.29	0.588
RIEVO × Dummy 1	−1.21	0.58	4.33	0.037
RIEVO × Dummy 2	0.57	0.62	0.85	0.357

Note. $n = 94$, Max-rescaled $R^2 = .16$. Dummy 1 = Satisfaction vs. Neutral, Dummy 2 = Dissatisfaction vs. Neutral.

outcome due to categorization. In fact, model prediction increased by eliminating participants who did not exhibit decision-making consistent enough to reach categorization.

DISCUSSION

The present studies provide evidence for the propositions that goal primes that generate cooperative behavior do so primarily a) for people who represent the incentive value of cooperation (i.e., high RIEVO) and b) if the goal prime specifically signals an incentive. Study 1 provided direct evidence for the former proposition in that RIEVO predicted the extent to which participants fished with restraint in the relatedness prime condition. Study 1 also generated circumstantial evidence for the latter proposition in that all of the priming materials signaled the satisfaction of relatedness, and participants reported more relatedness satisfaction in this condition than in the control condition after playing a cooperative game. Study 1 did not systematically vary the incentive signaling of the primes, however, and so it could not rule out the possibility that goal-relevant cognitions in general were responsible for the effects. Study 2 replicated Study 1's support of proposition a, and also further supported proposition b by demonstrating that high RIEVO participants enacted greater cooperative behavior only if the prime signaled satisfaction.

The present results suggest that high RIEVO people may act cooperatively because they represent the reward value of this behavior and thus seize on opportunities to pursue it. These findings extend our understanding of the RIEVO construct. High RIEVO people have been previously shown to behave cooperatively in resource dilemmas. Further, groups composed of high RIEVO individuals tend to fare better in dilemmas than groups characterized by members with low RIEVO (Sheldon & McGregor, H., 2000), and RIEVO provides a point of naturalistic assortment in humans: high (low) RIEVO people tend to have high (low) RIEVO friends (Sheldon et al., 2000). The present findings suggest that this self-assortment tendency may be driven by seeking potentially rewarding situations with others that afford these experiences pursuits more frequently. Not only could this provide experiential reward from satisfying personally important goal pursuits, it may also help provide a functional benefit because cooperative groups tend to outperform competitive ones over time, and this is most likely to occur when individuals are "choosey" about interaction partners so that they eventually lock in to mutually advantageous relationships (see McNamara, Barta, Fromhage, & Houston, 2008).

The present studies also extend our understanding of goal priming processes in important ways. The model proposed by Custers and Aarts (2010) suggests that primes automatically prepare a behavioral program, but that primes will only translate into behavior if the person represents a reward value in the pursuit. Past research in support of this has shown that rewards associated with primed behavior increase prime effectiveness (Milyavsky et al., 2012), and that goal contagion is not effective if observed goal pursuit is unattractive (Aarts, Gollwitzer, & Hassin, 2004). The present studies support this contention in a few ways. For one, only those individuals who orient toward the relevant reward domain were influenced by the prime. That is, only those people who really valued contribution to collaborative goals enacted cooperative behavior. Secondly, only those goal primes that could prompt incentive processing aroused subsequent goal-relevant behavior. That is, only those primes that suggested relatedness satisfaction led people high in RIEVO to behave more cooperatively. Together, these findings suggest that, just as a proper will and way are important for effective goal striving in the long term (Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011; Oettingen & Gollwitzer, 2010), so too are they for the effects of goal priming in the short term. That is, the person must want the reward (will), and also be in a situation that affords the satisfaction (way).

Finally, the present findings underline the promise of assessing broad motivational constructs that are not isomorphic with the outcome behavior for predicting behavioral following goal primes. Unlike Aarts and colleagues (2005), in which they demonstrated that believing that helping is important led to helping behavior under a helping prime, here we show that cooperative behavior can be predicted from a more general motivational orientation and under less direct goal prime content. This has implications for personality assessment in applied contexts, where researchers and practitioners may not be able to employ such precise measures in situations where they would like to predict the likelihood that people will engage in certain classes of desirable organizational behaviors across many contexts.

For example, companies that rely heavily on production from collaborative teamwork among employees may wish to hire people who hold intrinsic values central for those positions, as they are more likely to translate ambient organizational cues as well as explicit directives for cooperation into behavior. Similarly, these same types of companies may wish to avoid selfishly inclined people because attempts to increase their cooperation is likely to fail, and thus they would lose both in terms of potential production as well as through wasted attempts at intervention. Further, organizations working in situations characterized by rapid change or instability such that organic organization is needed (e.g., less formal procedures, distributed decision making through the hierarchy; cf. Lawrence & Lorsch, 1967) could benefit from similar personnel decisions, as the intra-organizational informality and inter-organizational competition may combine to create a situational press that signals the opportunity, for an individual, and need, for the organization, for cooperative action.

Limitations and Future Directions

Of course, before any real-world intervention grounded in the results of lab-based research is made in an actual organizational setting, it is imperative that relevant research be carried out to examine generalizability to the context of the intended intervention, examine other potential boundary conditions, etc. Some important steps in this direction would be to begin to assess how the potential for personal monetary gain impacts the effects reported presently and to invent

ways of subtly cuing relatedness that do not rely on the manipulations employed for experimental purposes (i.e., scrambled sentences). It is also important to consider the fact that individuals tend not to interact with people with whom they may cooperate or compete only once, especially in organizational settings, so incorporating the temporal dimension to capture iterated dilemma behavior will also be necessary to better understand these processes (for a review of temporal dynamics in social dilemmas, see, e.g., Prentice & Sheldon, in press).

Study 2's effects were weaker than those of Study 1. This may be partly due to the fact Study 1 had a small sample size, which introduces the possibility of overfitting. It may also be the case that the TDM measure of cooperation in Study 2 constitutes a stronger situation than the fishing game used in Study 1 in that the TDM is much more structured and unambiguous (Snyder & Ickes, 1985). Stronger situations tend to diminish the effects of dispositions on cooperative behavior (reviewed in Van Lange et al., 2007). This may explain, too, why RIEVO predicted less taking from the resource even in the control condition in Study 1 ($\beta = -.20$), as would be expected from the research on RIEVO and cooperation reviewed above, but this was eliminated in the control condition in Study 2 ($\beta = .02$).

Future research should examine how cooperation can be increased in other contexts. The present studies provide evidence for the prime \times RIEVO interaction in $n = 2$ and $n = 4$ take-some dilemmas, but this is a small sampling of cooperative contexts and behaviors. Past research has suggested that unwaveringly consistent contributors in human *give-some* social dilemmas set cooperative norms for their groups (Weber & Murnighan, 2008). Thus, one promising avenue of future research could examine whether high RIEVO participants are also more likely to take the leap of faith to consistently provide to the common good, and whether priming may lead them to make greater contributions and set group norms accordingly. Finally, these results suggests that it may take more than situational cues to get extrinsically-oriented individuals to cooperate more, and more research is needed to investigate how this can be done. After all, in terms of dilemma outcomes, the extrinsically-oriented tend to carry the most risk for the group. The starting point for increasing cooperation in extrinsically-oriented people may be instead to change value orientations in the long-term or to make intrinsic values more situationally accessible when cooperation is called for, perhaps through value activation and confrontation procedures (see e.g., Maio, 2010).

Conclusion

Human groups and organizations are likely to fail if they cannot establish and maintain cooperation. The present studies provide evidence that individuals who find it more important to contribute to their communities and build affiliative relationships with others than to strive for financial gain and popularity are more likely to act on a primed goal for cooperation. Thus these results provide some insight into the type of person who may be reliably called upon when cooperation is required and facilitate collective action.

NOTES

1. Pavey and colleagues (2011) "highlighted" relatedness by introducing a relatedness scrambled sentences task while also providing instructions that suggested the experimenters valued the participants' contributions to the study and

would “help and support” (p. 907) the participant throughout the task, which was also unique to the relatedness condition (Studies 1 & 3). Thus, this methodology confounds activation via the prime with satisfaction via the instructions. In Study 2, the researchers highlighted relatedness by using an affirmation procedure adapted from Reed & Aspinwall (1998), which again is likely to satisfy the need, rather than simply activate the motive.

2. Similar research to the present has suggested that religious primes generate more cooperative behavior than neutral or business primes in the Dictator Game, especially for participants with a highly consistent social value orientation (Smeesters, Yzerbyt, Corneille, & Warlop, 2009; Study 1). This does not address the current hypothesizing directly because consistency does not speak to whether the orientation is prosocial or proself. In a second study using the same outcome, the reported results do not indicate whether prosocial SVO predicted cooperative behavior in the religious priming condition, the effect that is conceptually closest to that being tested here. Further, the presence of non-unique predictors in the model used to test this assertion (both SVO and SVO consistency—both measured by deviations from the orientation score—were included in the model simultaneously) is problematic for interpreting their reported findings.
3. The original study design also included an achievement prime condition. The overall model and focal interaction between prime condition and RIEVO were also significant when achievement prime was included in the model. We focus theory and analysis only on the relatedness domain across these two studies because achievement motives are less directly relevant to the intrinsic versus extrinsic value orientation distinction and cooperative behavior.

AUTHOR NOTES

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